DotTalk++ Phase 1A: Introspection & Status Enhancements

# 1. Overview

Phase 1A extends DotTalk++ with improved introspection commands. The goal is to provide developers with rich, reliable insight into the state of tables, work areas, indexes, and environment settings without affecting data operations. This phase includes updates to AREA, SELECT, STRUCT, FIELDS, and STATUS.

# 2. AREA Command Improvements

The AREA command now prints a detailed snapshot of the current workspace.

* - Current area number.
* - File name and path.
* - Record count, current record pointer.
* - Order state (ASCEND/DESCEND).
* - Active tag (name, expression).
* - Index tags loaded (list with name and expression).
* - Dirty flags (table/index).

# 3. SELECT Command Integration

SELECT n now prints an AREA snapshot immediately after switching. This confirms active table, index, and order state.

# 4. STRUCT Command Upgrade

The STRUCT command now provides a developer-grade schema view.

* - Field number, name, type, length, decimals.
* - Null flag if supported.
* - KEY? flag if field is part of active index tag expression.
* - Table filename, record length, field count.
* - Active order: tag name, direction, expression.

# 5. FIELDS Command (Refined)

FIELDS continues to list basic schema, but with a clean compact table. A single line cross-reference suggests running STRUCT for full detail.

# 6. STATUS Command Enhancements

STATUS has been enhanced to provide detailed introspection.

* - Workspace: current area, file, path, open mode, codepage.
* - Table: record count, recno, record length, SET DELETED/EXACT/FILTER/WHILE.
* - Order / Index: order direction, active tag, index handles, per-tag details.
* - Cursor / Cache: cursor position, cache hits/misses, memory usage.
* - Dirty flags: table/index, pending reindex.
* - Recent Ops: last command executed, last error.

New submodes:

* - STATUS ALL – summary line for every area.
* - STATUS BRIEF – single screen summary.
* - STATUS INDEX – only the index section.
* - STATUS JSON – machine-readable one-line output.

# 7. Example Outputs

AREA (with indexes):

Current area: 1  
File: students.dbf Recs: 100 Recno: 42  
Order: ASCEND Active tag: L (UPPER(LAST\_NAME))  
Index tags loaded:  
 - L → UPPER(LAST\_NAME)  
 - LF → UPPER(LAST\_NAME)+UPPER(FIRST\_NAME)

STRUCT:

Table: students.dbf Fields: 6 Record length: 128 bytes  
Active order: TAG L (ASCEND) → UPPER(LAST\_NAME)  
  
# NAME TYPE LEN DEC NULL KEY?  
1 ID N 6 0 N N  
2 FIRST\_NAME C 20 0 N N  
3 LAST\_NAME C 20 0 N Y  
4 BIRTHDATE D 8 0 N N  
5 GPA N 4 2 N N  
6 ACTIVE L 1 0 N N

STATUS (abridged):

Workspace  
 Current area: 1  
 File: students.dbf  
Table  
 Records: 100 Recno: 42 Record length: 128  
Order / Index  
 Active tag: L -> UPPER(LAST\_NAME)  
 Indexes: 2 handles, active: L  
Cursor / Cache  
 Cursor position: key='GRIMWOOD' approx-rank=73  
Recent Ops  
 Last command: SEEK LAST\_NAME "GRIMWOOD"

# 8. Next Steps

Implement Phase 1A as follows:

* - Add AREA enhancements.
* - Integrate AREA snapshot after SELECT.
* - Upgrade STRUCT to detailed schema view.
* - Refine FIELDS for compact listing.
* - Extend STATUS with full detail and new submodes.
* - Test sequence: USE, INDEX, STATUS, AREA, STRUCT, SELECT, CLOSE.